

WHAT IS CLAIMED IS:

1. A nitrogen oxide removal catalyst system, comprising a first reaction part for denitrating nitrogen oxides by reacting said nitrogen oxide with ammonia, being provided with a first catalyst containing, as active constituents, at least: a complex oxide consisting of two or more oxides selected from silica, alumina, titania, zirconia, and tungsten oxide; and a rare earth metal or a transition metal (except Cu, Co, Ni, Mn, Cr, and V); and
- 10 a second reaction part for oxidatively decomposing ammonia that has leaked from the first reaction part, being provided with a second catalyst containing, as active constituents, at least: a noble metal and a silica-alumina type complex oxide.
- 15 2. The nitrogen oxide removal catalyst system of claim 1, wherein the first catalyst further contains sulfur or phosphorus.
3. The nitrogen oxide removal catalyst system of claim 2, wherein the first catalyst contains, as active constituents, at least: a titania-zirconia type complex oxide; a rare earth metal or a transition metal (except Cu, Co, Ni, Mn, Cr, and V); and sulfur or phosphorus.
- 20 4. The nitrogen oxide removal catalyst system of claim 2, wherein the first catalyst contains, as active constituents, at least: a tungsten oxide-zirconia type complex oxide; a rare earth metal or a transition metal (except Cu, Co, Ni, Mn, Cr, and V); and sulfur or phosphorus.

5. The nitrogen oxide removal catalyst system of claim 1, wherein the first catalyst contains, as active constituents, at least: a silica-alumina type complex oxide and a rare earth metal.

5 6. The nitrogen oxide removal catalyst system of claim 1, wherein the first catalyst consists of a silica-alumina type complex oxide and a transition metal (except Cu, Co, Ni, Mn, Cr, and V).

7. The nitrogen oxide removal catalyst system of any one 10 of claims 1 to 6, wherein a composite containing, as active constituents, at least: an oxide selected from silica, alumina, titania, zirconia, and tungsten oxide; and a rare earth metal or a transition metal (except Cu, Co, Ni, Mn, Cr, and V), is supported by the first catalyst.

15 8. The nitrogen oxide removal catalyst system of any one of claims 1 to 7, wherein a composite containing, as active constituents, at least: an oxide selected from silica, alumina, titania, zirconia, and tungsten oxide; and a rare earth metal or a transition metal (except Cu, Co, Ni, Mn, Cr, and V), is 20 supported by the second catalyst.

9. The nitrogen oxide removal catalyst system of any one of claims 1 to 8, wherein said catalyst is supported by a carrier substrate.

10. The nitrogen oxide removal catalyst system of any one 25 of claims 1 to 9, further comprising, at an upstream side of thee first reaction part, a third reaction part for oxidizing a nitrogen compound by reacting the nitrogen compound with

oxygen.

11. A nitrogen oxide removal method comprising  
denitrating nitrogen oxides reductively by contacting  
the nitrogen oxides with a first catalyst in the presence of  
5 ammonia, the first catalyst containing, as active constituents,  
at least: a complex oxide comprising two or more oxides selected  
from silica, alumina, titania, zirconia, and tungsten oxide;  
and a rare earth metal or transition metal (except Cu, Co, Ni,  
Mn, Cr, and V); and
- 10 decomposing unreacted ammonia oxidatively by  
contacting the untreated ammonia with a second catalyst, the  
second catalyst containing, as active constituents, at least,  
a noble metal and a silica-alumina type complex oxide.